IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket: **RUHLAND=2**

In re Application of:	)	Conf. No.: **2874**
Karl Ruhland	)	Art Unit: **3724**
Appln. No.: **10/572,581**	)	Examiner: **Clark F. Dexter**
Filed: **March 20, 2006**	)	Washington, D.C.
For: **CUTTING ARRANGEMENT**	)	

DECLARATION UNDER 37 CFR § 1.132

I, Karl Ruhland, Kirchsteig 18, 92536 Pfreimd, Federal Republic of Germany, to my best knowledge declare the following:

1. I am one of the inventors of an invention which has been filed with the US Patent and Trademark Office as a patent application Ser. No. 10/572 581 on May 24, 2005 (international filing day). I have reviewed the above-identified application, including the specification, drawings, and pending claims, and also the prosecution of the application, including the office actions, the cited art, and the responses that have been filed to-date.

2. I am fully experienced in cutting arrangements for producing corrugated boards as well as in the design and setup of such cutting arrangements since I have been working in this field for more than 14 years. I believe myself to be a person ordinarily skilled in the art of manufacturing sheets of corrugated board, based on my 14 years working in this field. Furthermore, I am familiar with the prior art cited by the US PTO in connection with my aforesaid invention.

3. I understand that the Examiner has taken the position that the claimed invention

would have been obvious to one of ordinary skill in the art at the time the invention was made in view of a combination of five references.

4. I understand that a claimed invention is only obvious based on a combination of prior art if the differences between it and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made.

5. I have been informed and understand that four factual issues are relevant to non-obviousness: (a) the scope and content of the prior art; (b) the level of ordinary skill in the art; (c) the differences between the claimed invention and the prior art; and (d) the presence of certain objective considerations of non- obviousness such as commercial success, a long felt but unsolved need, failure of others, and copying.

6. I understand that it is impermissible to use the patent as a template (and reason) for combining prior art references as that would be applying hindsight. A person of ordinary skill in the art that has to be motivated to combine references to create the combination of features required by the patent claims.

7. I understand that a rejection based on obviousness must be supported by a rationale that would have been apparent to a person of ordinary skill in the art for both how and why to combine prior art references to produce the claimed invention at the time of the invention.

8. Although there may be an apparent motivation to combine prior art references because of the task at hand, a person of ordinary skill in the art would not combine references that literally teach away from each other. Combining such references would likely provide unpredictable results, if the results were workable at all. Moreover, a predictable result that is unsuitable for the task at hand would likewise

provide no motivation for combination. The predictable results would be known to be unusable and therefore the person of ordinary skill in the art would look elsewhere.

9. I understand that claims 1, 7 and 11 were rejected under 35 U.S.C. § 103 as being unpatentable over Haas (German Publication No. 22 25 152) in view of Clark (U.S. Patent No. 3,942,210) and/or Cherry (U.S. Patent No. 2,360,826) and/or Parr (U.S. Patent No. 3,405,751) and/or Heine (U.S. Patent No. 4,661,031). Claims 4, 5 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Haas, Clark, Cherry, and/or Heine, and further in view of Sauer (U.S. Patent No. 3,285,642).

10. Claim 1 recites

A cutting arrangement which is disposed on a distance of travel of a web of corrugated board that is continuously produced by a corrugating machine, the cutting arrangement comprising:

a. a blade shaft which is mounted on a blade shaft axis of rotation for drivable rotation and which comprises at least one circular blade thereon; and
b. a brush roll which is disposed opposite to the blade shaft and mounted on a brush-roll axis of rotation for rotation, supporting the web of corrugated board which passes between the circular blade and the brush roll when the web of corrugated board is cut by the at least one circular blade;
c. the brush roll comprising shells which are disposed on a roll core and have a cross-sectional shape of a segment of a circle and which have
   i. an outside and an inside , the inside faces towards the roll core;
   ii. bristles which stand out from the outside;
   iii. torque-transmission means for transmitting torque from the roll core to the shells; and
   iv. fastening means for fixing the shells to the roll core;

d. wherein holes are provided in the roll core and on the inside of the shells, respectively accommodating a fastening pin for non-rotary connection of the shells with the roll core; and

e. wherein the fastening pin comprises two threaded portions of different pitches.

11. Webs of corrugated board are produced on corrugating machines and then cut to size. Therefore, longitudinal cuts are produced in pre-determined positions. In a longitudinal cutting arrangement driven circular blades are arranged on one side of a web of corrugated board. A brush roll is located on the opposite side which supports the corrugated board when the longitudinal cut is made and which the circular blade can simultaneously immerse into when the cut is made. During the production of longitudinal cuts, the bristles of the brush roll are subject to wear so that the entire brush roll must be replaced regularly. This is time-consuming and costly.

12. When I thought about solving the aforementioned problem, I surprisingly found that a cutting arrangement according to my invention enables simple and therefore timesaving replacement of the brush roll. Therefore, the necessary replacement of the brush roll is time- and cost-effective. Since the brush roll is formed by a cylindrical, rotatable roll core enveloped by shells of a cross-sectional shape of a segment of a circle, in particular half shells, the shells are easily radially mountable on the roll core of the cutting arrangement. The shells have bristles outside. On the inside, means are provided that enable the shells to be non-rotarily joined to the roll core. That means that after mounting the shells on the roll core the shells together build the cylindrical brush roll that is fixed on the roll core. For that purpose holes are provided in the roll core and on the inside of the shells, respectively accommodating a fastening pin for non-rotary connection of the shell with the roll core. According to my invention the fastening pin that accommodates in holes in the shells as well in the roll core comprises two threaded portions of different pitches. Since the fastening pin accommodates in the said holes, these also comprise different pitches, wherein a thread inside the half shell fits with a first, external thread por-

tion of the threaded pin and an internal thread inside the roll core fits a second, internal thread portion of the threaded pin.

13. With this design of the fastening pin and the holes comprising threads of different pitches it is possible to enhance the mounting of the shells on the roll core. In a first step the threaded pin is screwed by the first, external thread portion into the hole in the shell. After that the half shell is placed on the roll core. Then the threaded pin is screwed from outside of the shell through the hole in the shell with the second, internal thread portion into the internal thread of the roll core. With the pitch of the second, internal thread inside the roll core exceeding the first, external thread portion inside the shell, the threaded pin is driven per revolution faster into the roll core than it is screwed out of the shell. In this way the shell is fastened on the roll core. By this design according to my invention a fast and easy mounting process is enabled. Further, since the fastening pin comprises two threaded portions of different pitches the shells are fastened on the roll core in a very easy and very secure way. This securing is reached by tighten the shells across the cylindrical shape of the roll core. The shells are in-plane aligned with the roll core.

14. Haas (DE 2 225 152) discloses a cutting arrangement with a cutting tool 7 and an brush roll 9 arranged opposite to the cutting tool 7. The brush roll 9 comprises two brush rings each having rows of bristles 91, 92. The brush rings are coaxially aligned and fixed to each other axially by screws (see page 7, last paragraph to page 8, first paragraph and figures 7, 8). Therefore, the brush roll according to Haas firstly has to be connected to a socket 6 and after that the socket 6 is mounted on the drive shaft 2 by a clamping mechanism. The cutting arrangement according to Haas comprises an enlarged number of single pieces and is therefore complex and cost-intensive. Further, mounting such a system is time-consuming.

15. Clark (US 3,942,210) discloses a brush frame 12 and shells 14 to be mounted on the frame 12. Therefore openings 39 and 41 are provided in the shell 14 and the

frame 12, respectively. According to Clark a conventional screw 42 is used for connecting the shells 14 with the frame 12 wherein each screw 42 extends through each opening 39 in the shell 14 and threadably engages the bore 41 in the frame 12. Therefore, it becomes clear that the opening 39 has no threaded portion. The connection between the shells 14 and the frame 12 is only given by the screw 42 that is held in the bore 41. This is a conventional connection of two parts by clamping with a screw, i.e. a pointwise clamping. In addition, this method does not enable a secured connection according to my invention (see column 4, line 66 to column 5, line 7 and figures 1, 2).

16. Parr (US 3,405,751) discloses bolts and nuts with different threaded portions. According to Parr these bolts and nuts are used as self-locking elements. This self-locking function is caused by using for instance a bolt according to Parr with a conventional nut, i.e. a nut with a conventional formed thread of constant pitch. Screwing in the bolt in the standard nut the threaded portion of the bolt that differs from standard gauge thread is compressed or expanded, so that yielding retains, respectively, and therefore the compressed or expanded position reaches a "static" position (see column 3, lines 34 to 49). Further, Parr also describes the usage of a nut 60 of different threaded portions in cooperation with a lead screw in order to eliminate backlash between the nut and the screw. Therefore, the threaded portions 64, 66 are compressed or expanded elastically. Contrary to my invention, Parr discloses that one of the connecting members, i.e. screw or nut, comprises two threaded portions of different pitch and the other connecting member has a standard gauge thread. Self-locking of the connecting members is reached by elastically deformation of one of the members. Using self-locking elements according to Parr leads to pointwise elastic deformation of connecting elements (see column 3, lines 50 to 59 and figures 7, 8). This is not a secured connection. Anyway, cutting arrangement and a brush roll comprising shells are not disclosed by Parr at all.

17. Cherry (US 2,360,826) also discloses self-locking screws and bolts. According to Cherry a screw may comprise two screw threads 15, 16, wherein only the threaded portion 16 accommodates with the thread of connecting members 20, 21. The difference in the pitch or size of the threads 15, 16 is so selected that the screw can be turned into the opening by the usual operation, but with the result that the larger threads of the screw display a certain amount of metal of the female threads. This action causes a ring or waves of metal to be formed on the inner surface of the opening just ahead of the threads on the upper portion 15. This ring or wave of metal increases as the screw cuts further and further into the opening, whereby at the time that the screw is fully seated, a sufficient ring of metal has been formed on the inner surface of the opening to occupy and substantially fill the space or groove provided at the portion 17 that separates the threaded parts 15 and 16 of the screw (see page 1, right column, lines 26 to 41 and figure 1). According to Cherry a self-locking screw cuts a thread into material. Therefore, especially repeated mounting and dismounting is not adequate with a screw of Cherry since the thread is irreversibly modified.

18. Heine (US 4,661,031) comprises a screw with two threaded portions that are offset relative to one another. As shown in figure 2 of Heine-document the threaded portion 24 has tapered threads 31 that have the same (or substantially the same) pitch as the rest of the threads 30. The crest of the tapered threads 31 gradually increases from virtually zero to attain, at the end of the taper, the crest of the regular thread 30 (see column 5, lines 51 to 56). Firstly, a screw according to Heine does not disclose that the pitches of the threaded portions 22 and 24 are different. Secondly, using a screw having a tapered thread according to Heine unavoidably leads to a certain amount of friction and spring force which acts to lock the screw in the threaded hole 16 (see column 5, lines 66 to 68). This, similar to Parr, leads to a pointwise and not in-plane tightening of the connecting parts.

19. Even a combination of all prior art documents cited by the Examiner does not lead to the cutting arrangement according to my invention. Even if a person ordinarily skilled in the art had tried to use self-locking elements that are disclosed by Parr, Cherry or Heine for mounting shells on a brush frame according to Clark, he would not have come to my invention. Firstly, the person would not have tried to apply a screw according to Cherry since the roll core would have been cut by the screw. Therefore, if disassembly and afterwards again assembly of the cutting arrangement with a new brush roll becomes necessary, new screws – especially of larger diameter – would be necessary since the firstly used screws have irreversibly modified the hole in the roll core. One of ordinary skill in the art would have recognized this disadvantage, and not been motivated to make the combination in light thereof. Secondly, also self-locking elements according to Parr and/or Heine do not lead to my invention. Heine does not disclose a fastening pin with threaded portions of different pitches. Although Parr discloses a screw with two threaded portions of different pitch, it is further disclosed to use this self-locking element in cooperation with a nut of constant standard gauge thread, so that the screw is elastically tightened in the nut. By usage of such fastening elements only a pointwise fixation of the brush roll on the roll core could be reached. This does not simplify assembly and disassembly and further does not enhance the security of fixation, thus, one of ordinary skill in the art would not have been motivated to use these configurations.

20. According to my invention the fastening pin comprises two different thread portions of different pitches, wherein each threaded portion accommodates in one thread of holes in the roll core and in the shells, respectively. Only by this design of the cutting arrangement it is possible to easily, fast and directly connect the brush roll on the roll core. Especially, a two-dimensional, in-plane tightening of the brush roll on the roll core is enabled and therefore the security of the mounting of the cutting arrangement according to my invention is enhanced. In addition, all the screws described by Parr, Cherry and Heine comprise a screw head. It is one

aspect of my invention as described in detail in paragraph 4 that the fastening pin is screwed through the hole in the brush roll on the roll core. Thus, a head on the fastening pin is not allowed.

21. The undersigned declares further that all statements made herein of his knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Pfreimd, March, 19th, 2010

(Karl Ruhland)